

20. The food as claimed in claim 19, wherein the composition is present in an amount of 3 to 5% of the total food weight.

21. A dietary supplement consisting essentially of α -linolenic fatty acid (n-3, 18 : 3) and linoleic fatty acid (n-6, 18:2) for administration to an animal such that the weight ratio of the daily supply of linoleic fatty acid to α -linolenic fatty acid to said animal is 0.05-7.5.

22. The dietary supplement as claimed in claim 21, wherein the animal is human.

REMARKS

Favorable reconsideration is respectfully requested in view of the foregoing amendments and the following remarks.

With respect to Applicants' claim for foreign priority, Applicants have submitted along with the response certified copies of the Korean priority documents upon which the claim of priority is based. Applicants respectfully request acknowledgment of receipt of said certified copies at the Examiner's convenience.

The specification has been carefully reviewed and editorial changes have been effected. All of the changes are minor in nature and therefore do not require extensive discussion. Specifically, the specification headings have been amended in conformance with U.S. practice.

Claims 3 and 4 have been cancelled without prejudice. Further, claims 1 and 2 have been amended and new claims 5-22 have been added. The claim amendments and new claims have been presented to put the claims in better form under U.S. practice and to further protect other

specific embodiments of the present invention. Support for the claim amendments and new claims is readily apparent from the teachings of the specification and the original claims. Specific support can be found on pages 4-6 of the specification. Applicants note that new claims 21 and 22 is directed to a dietary supplement which can be taken in addition to other sources of linoleic fatty acid and/or α -linolenic fatty acid to correct any imbalance in their daily supply.

With regard to the rejection of claims 1-4 under 35 USC § 112, second paragraph, this rejection has been overcome by the amendments to the claims. Specifically, the term "higher" has been deleted from the claims. Further, the claims have been amended to specify that the weight ratio of said linoleic fatty acid to said α -linolenic fatty acid is 0.05-7.5 and preferably 0.05-2.0. Applicants believe that the amendments to the claims overcomes the Examiner's rejection and thus, respectfully request that this rejection be withdrawn.

With regard to the rejection of claims 1-4 under 35 USC § 102(e) as being anticipated by Igarashi et al. (USP 6,159,507), this rejection is overcome by the filing of the verified translations of the certified priority documents. With the perfection of priority, the present application has a priority date of March 10, 1999 which is prior to the filing date (March 26, 1999) of Igarashi et al. (USP 6,159,507). Thus, Applicants respectfully request that this rejection also be withdrawn.

With regard to the rejection of claims 1-4 under 35 USC § 102(b) as being anticipated by Schmidl et al. (USP 5,504,072), this rejection is deemed to be untenable and is thus respectfully traversed.

To constitute anticipation of the claimed invention, a single prior art reference must disclose each and every material element of the claim. Here, in this case, Schmidl et al. fail to

teach an unsaturated fatty acid composition consisting essentially of "linoleic fatty acid (n-6, 18 : 2) and α -linolenic fatty acid (n-3, 18 : 3)" as recited in the amended claims. The composition in Schmidl et al. comprise 4-30% lipid component, 65-80% carbohydrate component and 16-25% protein component, based on total caloric content and thus is not an "unsaturated fatty acid" composition but a enteral nutritional composition. In other words, Schmidl et al. is not directed to a composition comprising substantially all fatty acids as required by the amended claims. *main invention*

Further, it is important to note that Schmidl et al. only disclose improved enteral nutritional compositions which are useful in treating stressed and catabolic conditions. The lipid component is disclosed as comprising ω -6 polyunsaturated fatty acids, such as linoleic fatty acid, and ω -3 polyunsaturated fatty acids, such as α -linolenic fatty acid. The ω -6 polyunsaturated fatty acid comprises 2-4% of the total calories and the ω -3 polyunsaturated fatty acid comprises 0.2-1% of the total calories (see column 4, lines 26-29, of the reference). As such, Schmidl et al. merely teaches a composition for treating stressed and catabolic conditions in which the ratio ω -6 polyunsaturated fatty acid to ω -3 polyunsaturated fatty acid exceeds 2:1. *no-
fat
catabolic*

The claimed ratios have a superior and unexpected property as compared to that disclosed in Schmidl et al. As described on page 10, lines 1-3, of the present specification, when the ratio of linoleic fatty acid to α -linolenic fatty acid exceeds the optimal ratio of 2:1, the cerebral DHA concentration decreased. However, it is important to note that the ratio of 0.05-7.5 still achieves the result of improving synthesis of DHA in the body.

Therefore, in view of the above, Applicants submit that the present invention as described in the new and amended claims is not taught or suggested by Schmidl et al. and that this rejection should be withdrawn.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"


In view of the foregoing amendments and remarks, it is respectfully submitted that the Application is now in condition for allowance. Such action is thus respectfully solicited.

If, however, the Examiner has any suggestions for expediting allowance of the application or believes that direct communication with Applicants' attorney will advance the prosecution of this case, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

The claims have been amended as follows:

1. (Amended) [A higher] An unsaturated fatty acid composition [comprising] consisting essentially of linoleic fatty acid (n-6, 18 : 2) and α -linolenic fatty acid (n-3, 18 : 3), wherein the weight ratio of said linoleic fatty acid to said α -linolenic fatty acid in said composition is [0.05 to 7.5] 0.05-7.5.

2. (Amended) The composition as claimed in claim 1, wherein the weight ratio of said linoleic fatty acid to said α -linolenic fatty acid is [0.05 to 2.0] 0.05-2.0.



Higher Unsaturated Fatty Acid Composition

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BACKGROUND OF THE INVENTION

1. Field of the Invention

5 This invention relates to a higher unsaturated fatty acid composition comprising linoleic acid and α -linolenic acid.

10 *2. Description of the Related Art*
Docosahexaenoic acid (hereinafter "DHA") is a main higher unsaturated fatty acid present in the brains of mammals. It is well-known that DHA plays an important role in visual identification, recognition and learning faculty and memory.

DHA is involved in the synthesis of cholesterol, blood clotting inhibition, aging and cancer prevention.
15 Also, it has been recently found out that DHA is beneficial for the treatment of cardiovascular ailments, arthritis rheumatica and asthma and other lung diseases.

One has to take DHA and other higher unsaturated fatty acids from foods because they are not produced in ^{the} human body. With a rapid increase in old people population, the number of people suffering from age-related illnesses such as senile dementia is increasing. Such age-related diseases are closely related to the function of ^{the} brain. Thus a method is desired to
20 strengthen the brain function by replenishing DHA from foods.
25

linoleic fatty acid (n-6, 18 : 2) and α -linolenic fatty acid (n-3, 18 : 3), the weight ratio of said linoleic fatty acid (n-6, 18 : 2) to said α -linolenic fatty acid (n-3, 18 : 3) being from 0.05 to 7.5.

5 It was found out that by adjusting the weight ratio of linoleic fatty acid (n-6, 18 : 2) to α -linolenic fatty acid (n-3, 18 : 3) to the above value, DHA is synthesized most efficiently from this composition in the body, particularly in brain, so that this
10 composition strengthens the cognitive and learning faculty and memory.

Other features and objects of the present invention will become apparent from the following description made with reference to the accompanying
15 drawings, ~~in which:~~

BRIEF DESCRIPTION OF THE DRAWINGS

Figs. 1 and 2 are graphs showing the relationship
20 between the dosage of the higher unsaturated fatty acid composition and the cerebral DHA concentration;

Fig. 3 is a graph showing the relationship between the dosage of the higher unsaturated fatty acid composition and the cognitive or learning ability in the
25 Morris maze test; and

Fig. 4 is a graph showing the relationship between

the dosage of the higher unsaturated fatty acid composition and the memory in the Morris maze test.

~~DETAILED~~ DESCRIPTION OF THE PREFERRED EMBODIMENT

5 The higher unsaturated fatty acid composition according to the present invention comprises linoleic fatty acid (n-6, 18 : 2)(hereinafter simply "linoleic acid") and α -linolenic fatty acid (n-3, 18 : 3)

10 (hereinafter α -linolenic acid).

Linoleic acid and α -linolenic acid can be extracted from various vegetable and animal oils, such as flax powder, flaxseed meal, flaxseed oil, other flax oils, and Perilla oil. They may be used separately or
15 mixed together. The linoleic and α -linolenic acids used in the present invention need not be refined ones. An intended higher unsaturated fatty acid composition may be prepared by adding oils containing linoleic and α -⁶⁰linolenic acid to foods containing higher unsaturated
20 fatty acids such as food for livestock so that the contents of linoleic and α -linolenic acid will be ^{at} predetermined values.

The weight ratio of linoleic acid to α -linolenic acid is preferably 0.05-7.5, more preferably 0.05-2.0.

25 If this ratio is below 0.05, the daily supply of linoleic acid would not reach the required minimum. This would

reduce the amount of DHA in the brain. It will also decrease if the above ratio is over 7.5. It will increase if the above ratio is between 0.05 and 2.0.

5 The higher unsaturated fatty acid composition according to this invention may be taken alone as a health food, or may be added to or mixed with other foods.

10 The higher unsaturated fatty acid composition according to this invention increases the amount of DHA in the brain of an animal to which this composition is administered, thus strengthening its cognitive power, learning power and memory. For this purpose, the daily dose of this composition is preferably 9-18 grams per 60 kg body weight (for an adult).

15 For example, it is necessary to take 1/3 of the daily requirement at each meal (i.e. at least 3 grams per meal for an adult weighing 60 kg), or eight capsules each weighing 0.4 gram at each meal. For this purpose, the composition of the present invention may be added to various foods (broiled or cooked), soy oil as a salad oil, 20 dairy products, capsules, bakeries, cereals, soy milk, etc.

If pregnant women or newborns are given this composition, or if adults take this composition by at least 9-18 grams daily per 60 kg body weight, synthesis of DHA in the brain will become maximum at birth, 25 weaning, or at coming of age. Thus, if the higher unsaturated fatty acid composition is taken continuously

ABSTRACT OF THE DISCLOSURE

A composition that makes it possible to take DHA efficiently. The composition contains linoleic fatty acid (n-6, 18 : 2) and α -linolenic fatty acid (n-6, 18 : 2) so that the weight ratio of the linoleic fatty acid to the α -linolenic fatty acid is 0.05 ~~to~~ to 7.5.